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LUND, JEFFRIE ROBERT	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OFFICEACTIONS@FDML.COM

Office Action Summary	Application No.	Applicant(s)	
	10/516,457	PUECH, MICHEL	
	Examiner	Art Unit	
	Jeffrie R. Lund	1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2009*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,15,16 and 19-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15,16 and 19-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sajoto et al, US Patent Application Publication 2002/0015855 A1.

Sajoto et al teaches a reactor comprising: a reaction chamber 120 surrounded by an aluminum leakproof wall 112; a substrate support 124; an aluminum heated liner 128 lining a part of the leakproof wall in a non-leakproof manner; a heating element (paragraph 49); a temperature regulator means (PID) for regulating the temperature to a temperature greater than 150 C. (entire document, specifically figure 3 and paragraph 49)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 6, 9, 12, 15, 16 and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al (US 6506254 B1) in view of Sajoto et al, US Patent Application Publication 2002/0015855 A1.

Bosch teaches a plasma processing apparatus comprising:

i. A reaction chamber (2) surrounded by a leakproof wall (outer perimeter of chamber), containing substrate support (8), and communicating with a plasma source (18) to form a plasma therein, is characterized in that it further comprises a heater liner (20) lining all or part of the leakproof wall (outer perimeter of chamber) of the reaction chamber (2) in non-leakproof manner, the heater liner coupled to a heater 28 and an intermediate thermal insulation space (area between 26 and wall) provided between the heater liner (20) and the leakproof wall (outer perimeter of chamber) of the reaction chamber (2) (See Fig. 6, Col. 10, lines 1-65). The heater liner presents a metal or alloy surface toward and substantially surrounding the plasma.

ii. The heater liner (20) is made of aluminum and is thermally coupled to a heater (28) such as electrical resistances (Col. 10, line 57) suitable for connection to an external source of electrical energy (Fig. 6, Col. 10, lines 24-58) – **claims 2, 3**.

iii. The intermediate space between the heater liner (20) and the leakproof wall (outer perimeter of 2) of the reaction chamber (2) communicate with the central space of the reaction chamber (2) via an annular space (area between 26 and 2) of small thickness (See Fig. 6) – **claim 6**.

iv. The heater liner is associated with a temperature-regulator means (heater 28 and temperature controlled member 30) for regulating its temperature in a desired range (See figure 6) – **claim 12**.

v. Downstream (see above drawing objection) from the substrate support (8) the

reaction chamber (2) is limited by a conductive grid (screen, 22) in thermal contact with the heater liner (20) (Fig. 6, Col. 10, 24-65) – **claim 15**.

vi. The substrate support (8) comprise electrostatic electrodes (electrostatic chuck) for attracting the substrate (6) (Col. 10, lines 6-10) – **claim 16**

Bosch et al differs from the present invention in that: The leak proof wall and liner are not metal.

Sajoto et al was discussed above and teaches:

i. A metal plasma processing chamber that has a heated aluminum liner.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the wall and liner of Bosch et al out of aluminum as taught by Sajoto et al.

The motivation for making the wall and liner of Bosch et al out of aluminum is to provide an alternate material of construction as taught by Sajoto et al. Furthermore, it has been held that: the selection of a known material based on its suitability for its intended use is prima facie obviousness (*Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)); and reading a list and selecting a known compound to meet known requirements is no more ingenious that selecting the last piece to put in the last opening in a jig-saw puzzle (325 U.S. at 335, 65 USPQ at 301).

5. Claims 4 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, US Patent 6506254 B1, and Sajoto et al, US Patent Application Publication 2002/0015855 A1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Inazawa et al, US Patent 5595627, Miller US Patent 4439463, and Frankel et

al US Patent 6019848.

Bosch et al and Sajoto et al do not teach:

i. A reactor according to claim 1, characterized in that it further comprises: an etching gas source, and means for controlling the etching flow rate to govern the introduction of etching gas into the plasma source; a passivation gas source, and means for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma source; and a control device adapted to cause the etching gas flow rate control means and the passivation gas flow rate control means to operate in alternation – **in claim 4, 26**.

Inazawa teaches a plasma etching apparatus comprising:

i. An etching gas source (70), and a mass flow controller (64) and valve (58) for controlling the etching flow rate to govern the introduction of etching gas into the plasma source; a passivation gas source (68), and a mass flow controller (62) and valve (56) for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma source; and a control device (78) adapted to control the flow rates of the etching gas and the passivation gas (See Fig. 1, Col. 5, lines 1-13).

Miller teaches a plasma processing apparatus comprising:

i. A solenoid valve (98) for controlling gas flow rate into the reactor (18) (See Fig. 3, Col. 6, lines 61-68).

Support for the “means for controlling” limitation of claim 4 is found in lines 11-16, page 9. Specifically, the specification teaches, “etching gas and etching

flow rate control means 9b such as a solenoid valve" and "means 9b for controlling passivation flow rate, e.g. a solenoid valve." Miller teaches a solenoid valve as part of a flow control system. As such, Miller teaches an equivalent apparatus that performs the function of controlling gas flow rate. As a result, Miller's prior art element of solenoid valve for controlling gas flow rate perform the identical function of controlling gas flow rate in substantially the same way, and produces substantially the same results as the corresponding elements disclosed in the specification (MPEP 2183).

Frankel teaches a plasma processing apparatus comprising:

i. A control device (processor, 50) adapted to select one of two sources (43, 47) of gases to be sent to the processing chamber (15) in alternation (See Fig. 1A-1E, Col 13, lines 18-27)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add to add Inazawa's gas sources and control to Bosch's and Sajoto's apparatus.

Motivation to add Inazawa's gas sources and control to the apparatus of Bosch et al and Sajoto et al is to provide a specific gas supply system with an etching gas (CO) and a passivation gas (S_4F_8) as required by Bosch et al and Sajoto et al et al but generically described.

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to replace Inazawa's valve with Miller's solenoid valve, and add Frankel's control device programming to Inazawa's control device.

Motivation to replace Inazawa's valve with Miller's solenoid valve is to provide an alternate gas control valve in the apparatus of Inazawa. Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc).*

Motivation to add Frankel's control device programming to Inazawa's control device is to allow multiple process steps to be performed in situ in the same chamber to reduce total processing time as taught by Frankel (in Abstract) by alternately supplying different gases to the processing chamber.

6. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, US Patent 6506254 B1, and Sajoto et al, US Patent Application Publication 2002/0015855 A1 as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Zhao et al US Patent 5885356.

Bosch et al and Sajoto et al do not teach:

i. A reactor according to claim 1, characterized in that the heater liner is fastened to the leakproof wall of the reaction chamber by a small number of fastening points – **as claimed in claim 5.**

ii. A reactor according to claim 5, characterized in that the fastening points are of thermally insulating structure opposing the transfer of heat energy by conduction from the heater liner to the leakproof wall of the reaction chamber – **as claimed in claim 7**.

Zhao teaches a substrate processing apparatus comprising:

i. A liner (44) is fastened to the leakproof wall (230) of a chamber (239) by a small

number of fastening points (screw, 41) (Figs. 4 and 5, Col. 7, lines 28-31) – **in claim 5.**

ii. The fastening points (screw, 41) are of thermally insulating structure (TEFLON ™) (Col. 7, lines 15-31) – **in claim 7.**

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to attaché the liner of Bosch et al and Sajoto et al with TEFLON™ screws as taught by Zhao.

The motivation for attaching the liner Bosch et al and Sajoto et al with Zhao's TEFLON screws as fastening points is to provide a mans of attaching the liner of Bosch et al and Sajoto et al. Furthermore, TEFLON™ is thermally and electrically insulating and is less susceptible to particulate formation as taught by Zhao (Col.3, lines 51-57).

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, Sajoto et al, and Zhao et a as applied to claim 5 above, and further in view of Freiberger et al, US Patent 3880396.

Bosch et al and Sajoto et al further teach that the liner can be supported in any suitable way (Bosch Col. 10, lines 28-29).

Bosch, Sajoto, and Zhao do not teach:

i. A reactor according to claim 5, characterized in that the heater liner (14) is suspended from the leakproof wall (2) of the reaction chamber (1) by three projections having heads, projecting beneath the face of the leakproof wall (2) and engaged in keyhole-shaped slots each having a wide portion and for passing a head and a narrow portion for retaining the head – **as claimed in claim 8.**

Freiberger teaches a quick change panel fastening system comprising:

i. Projections (23) having heads (23b), projecting beneath the face of the base structure (11) and engaged in keyhole-shaped slots (60) in a panel (10), each slot having a wide portion (60a) and for passing a head (23b) and a narrow portion (60b) for retaining the head (23b) (See Figs. 1, 4, 5; Col. 1, line 66 thru Col. 2, line 20; and Col. 3, line 53 thru Col. 4, line 21) – **in claim 8**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to fasten the liner of Bosch, Sajoto, and Zhao with the keyholes fastening components as taught by Freiberger.

The motivation for using Freiberger's keyhole fastening components to secure the liner of Bosch, Sajoto, and Zhao is to provide a simplified structure for quickly and easily mounting a panel on a base as taught by Freiberger (Col. 1, lines 18-20). Further, it is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

8. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, US Patent 6506254 B1, and Sajoto et al, US Patent Application Publication 2002/0015855 A1 as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Zhao et al. (US 5968379).

Bosch et al and Sajoto et al do not teach:

i. The electrical resistances comprise thin-film electrical resistances and/or electrical resistances of the thermocoaxial type – **claim 10**.

ii. A reactor according to claim 1, characterized in that the heater liner includes

heater (see above) suitable for heating it to a temperature higher than 150 degree C – **as claimed in claim 13**.

Zhao teaches a wafer processing apparatus comprising:

i. A heating element (107) of electrical resistances comprises thin-film (flat ribbon) electrical resistances capable of heating to 400 degree C (See Fig. 7C, Col. 7, lines 19-21; Col. 18, lines 49-55; Col. 20, lines 25-41) - **claims 10 and 13**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Sajoto's and Bosch's heater with Zhao's flat ribbon heating element.

The motivation to replace Sajoto's and Bosch's heater with Zhao's flat ribbon heating element is that Zhao's flat heating element provides a greater ratio of surface area to cross-section area, which transfers heat more effectively as taught by Zhao (Col. 20, lines 52-56).

9. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, US Patent 6506254 B1, and Sajoto et al, US Patent Application Publication 2002/0015855 A1 as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Sopory (US 6492629 B1)

Bosch et al and Sajoto et al do not teach:

i. The electrical resistances comprise thin-film electrical resistances and/or electrical resistances of the thermocoaxial type – **claim 10**.

ii. A reactor according to claim 1, characterized in that the heater liner includes a heater suitable for heating it to a temperature higher than 150 degrees C – **as**

claimed in claim 13.

Sopory teaches an electrical heating device comprising:

i. A flexible coaxial heater cable (100) that can maintain a temperature range of 500-600 degrees F(Fig. 6, Col. 7, line 18 to 38; Col. 10, lines 44-47) – **claims 10 and 13**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Bosch's and Sajoto's heater with Sopory's coaxial heater cable.

The motivation to replace Bosch's and Sajoto's heater with Sopory's coaxial heater cable is that Sopory's coaxial heater cable responds very rapidly to achieve an equilibrium state as taught by Sopory (Col. 7, lines 27-29).

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bosch et al, US Patent 6506254 B1, and Sajoto et al, US Patent Application Publication 2002/0015855 A1 as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Collins et al. (US 6063233).

Bosch et al and Sajoto et al further teach:

i. The heater liner can be heated by a radiant heater (Bosch Col. 10, lines 38-40) – **in claim 11**.

Bosch et al and Sajoto et al do not teach:

i. A reactor according to claim 1, characterized in that the heater liner is heated by radiant heater means such as infrared elements – **as claimed in claim 11**.

Collins teaches a plasma processing apparatus comprising:

i. Radiant heater means (see above) such as infrared elements (tungsten/halogen lamps, 72) (Fig. 4A, Col. 18, lines 17-35) – **in claim 11**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the generic radiant heating means of Bosch et al and Sajoto et al with the lamps of Collins.

The motivation for replacing the radiant heating means of Bosch et al and Sajoto et al with the lamps of Collins is because this type of radiant heater has minimal thermal lag, that is, response time to temperature setting change is very short (less than one second) as taught by Collins (Col. 18, lines 17-35).

11. Claims 1-3, 6, 9, 12, 15, 16 and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al (US Patent 6,518,195 B1), in view of Sajoto et al, Sajoto et al, US Patent Application Publication 2002/0015855 A1 and Bosch et al, US Patent 6506254 B1.

Collins et al teaches a reaction chamber (16B) surrounded by an aluminum leakproof wall (12), containing substrate support (32C), and communicating with a plasma source (360), a conductive grid 29; an electrostatic chuck (column 20 lines 50-51); an etching gas source (C_2F_6 or CF_4) (Column 10 lines 24-25); a passivation gas source (CH_3F, CHF_3) (column 10 lines 25-26); and is biased by power source 42. (Figure 1)

Collins et al differs from the present invention in that Collins et al does not teach: a liner lining all or part of the leakproof wall of the reaction chamber in non-leakproof manner, and an intermediate thermal insulation space provided between the liner and

the leakproof wall of the reaction chamber; that the liner presents a metal or alloy surface toward and substantially surrounding the plasma; and a temperature-regulator means.

Sajoto et al teaches a plasma processing apparatus that has heated aluminum liners.

Bosch et al was discussed above and teaches: a heater (28) such as electrical resistance heater suitable for connection to an external source of electrical energy; and temperature-regulator means 30.

The motivation for adding the liner of Sajoto et al to the apparatus of Collins et al is to shield components or walls of the chamber from the plasma, and receive residue material formed in the plasma, as taught by Sajoto et al.

The motivation for adding the heater of Bosch et al to the apparatus of Sajoto et al is to provide a specific type of heater. Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the heated liner of Sajoto et al and the heater of Bosch et al to the apparatus of Collins et al.

12. Claims 4 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al, US Patent 6,518,195 B1, Sajoto et al Patent Publication 2002/0015855 A1, and Bosch et al, US Patent 6506254 B1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Inazawa et al, US Patent 5595627, Miller, US Patent

4439463, and Frankel et al, US Patent 6019848.

Collins et al, Sajoto et al, and Bosch et al do not teach:

i. A reactor according to claim 1, characterized in that it further comprises: a means for controlling the etching flow rate to govern the introduction of etching gas into the plasma source; a means for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma source; and a control device adapted to cause the etching gas flow rate control means and the passivation gas flow rate control means to operate in alternation – **in claim 4, 26**.

Inazawa teaches a plasma etching apparatus comprising:

i. An etching gas source (70), and a mass flow controller (64) and valve (58) for controlling the etching flow rate to govern the introduction of etching gas into the plasma source; a passivation gas source (68), and a mass flow controller (62) and valve (56) for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma source; and a control device (78) adapted to control the flow rates of the etching gas and the passivation gas (See Fig. 1, Col. 5, lines 1-13).

Miller teaches a plasma processing apparatus comprising:

i. A solenoid valve (98) for controlling gas flow rate into the reactor (18) (See Fig. 3, Col. 6, lines 61-68).

Support for the "means for controlling" limitation of claim 4 is found in lines 11-16, page 9. Specifically, the specification teaches, "etching gas and etching flow rate control means 9b such as a solenoid valve" and "means 9b for

controlling passivation flow rate, e.g. a solenoid valve." Miller teaches a solenoid valve as part of a flow control system. As such, Miller teaches an equivalent apparatus that performs the function of controlling gas flow rate. As a result, Miller's prior art element of solenoid valve for controlling gas flow rate perform the identical function of controlling gas flow rate in substantially the same way, and produces substantially the same results as the corresponding elements disclosed in the specification (MPEP 2183).

Frankel teaches a plasma processing apparatus comprising:

i. A control device (processor, 50) adapted to select one of two sources (43, 47) of gases to be sent to the processing chamber (15) in alternation (See Fig. 1A-1E, Col 13, lines 18-27)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add to add Inazawa's gas sources and control to Collins's, Sajoto's, and Bosch's apparatus.

Motivation to add Inazawa's gas control to the apparatus of Collins et al, Sajoto et al, and Bosch et al is to provide a specific gas supply system as required by Collins et al, Sajoto et al, and Bosch et al et al but generically described.

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to replace Inazawa's valve with Miller's solenoid valve, and add Frankel's control device programming to Inazawa's control device.

Motivation to replace Inazawa's valve with Miller's solenoid valve is to provide an alternate gas control valve in the apparatus of Inazawa. Furthermore, it has been held

that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc).*

Motivation to add Frankel's control device programming to Inazawa's control device is to allow multiple process steps to be performed in situ in the same chamber to reduce total processing time as taught by Frankel (in Abstract) by alternately supplying different gases to the processing chamber.

13. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al, US Patent 6,518,195 B1, Sajoto et al Patent Publication 2002/0015855 A1, and Bosch et al, US Patent 6506254 B1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Zhao et al US Patent 5885356.

Collins et al, Sajoto et al, and Bosch et al do not teach:

i. A reactor according to claim 1, characterized in that the heater liner is fastened to the leakproof wall of the reaction chamber by a small number of fastening points – **as claimed in claim 5.**

ii. A reactor according to claim 5, characterized in that the fastening points are of thermally insulating structure opposing the transfer of heat energy by conduction from the heater liner to the leakproof wall of the reaction chamber – **as claimed in claim 7**.

Zhao teaches a substrate processing apparatus comprising:

i. A liner (44) is fastened to the leakproof wall (230) of a chamber (239) by a small number of fastening points (screw, 41) (Figs. 4 and 5, Col. 7, lines 28-31) – **in claim 5.**

ii. The fastening points (screw, 41) are of thermally insulating structure (TEFLON ™) (Col. 7, lines 15-31) – **in claim 7.**

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to attaché the liner of Collins et al, Sajoto et al, and Bosch et al with TEFLON™ screws as taught by Zhao.

The motivation for attaching the liner Collins et al, Sajoto et al, and Bosch et al with Zhao's TEFLON screws as fastening points is to provide a mans of attaching the liner of Collins et al, Sajoto et al, and Bosch et al. Furthermore, TEFLON™ is thermally and electrically insulating and is less susceptible to particulate formation as taught by Zhao (Col.3, lines 51-57).

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al, Sajoto et al, Bosch et al, and Zhao et al as applied to claim 5 above, and further in view of Freiberger et al, US Patent 3880396.

Collins et al, Sajoto et al, and Bosch et al further teach that the liner can be supported in any suitable way (Bosch Col. 10, lines 28-29).

Collins et al, Sajoto et al, Bosch et al, and Zhao et al do not teach:

i. A reactor according to claim 5, characterized in that the heater liner (14) is suspended from the leakproof wall (2) of the reaction chamber (1) by three projections having heads, projecting beneath the face of the leakproof wall (2) and engaged in keyhole-shaped slots each having a wide portion and for passing a head and a narrow portion for retaining the head – **as claimed in claim 8.**

Freiberger teaches a quick change panel fastening system comprising:

i. Projections (23) having heads (23b), projecting beneath the face of the base structure (11) and engaged in keyhole-shaped slots (60) in a panel (10), each slot having a wide portion (60a) and for passing a head (23b) and a narrow portion (60b) for retaining the head (23b) (See Figs. 1, 4, 5; Col. 1, line 66 thru Col. 2, line 20; and Col. 3, line 53 thru Col. 4, line 21) – **in claim 8**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to fasten the liner of Collins et al, Sajoto et al, Bosch et al, and Zhao et al with the keyholes fastening components as taught by Freiberger.

The motivation for using Freiberger's keyhole fastening components to secure the liner of Collins et al, Sajoto et al, Bosch et al and Zhao et al is to provide a simplified structure for quickly and easily mounting a panel on a base as taught by Freiberger (Col. 1, lines 18-20). Further, it is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

15. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al (US Patent 6,518,195 B1), Sajoto et al, Patent Publication 2002/0015855 A1, and Bosch et al, US Patent 6506254 B1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Zhao et al. (US 5968379).

Collins et al, Sajoto et al, and Bosch et al do not teach:

i. The electrical resistances comprise thin-film electrical resistances and/or electrical resistances of the thermocoaxial type – **claim 10**.

ii. A reactor according to claim 1, characterized in that the heater liner includes

heater (see above) suitable for heating it to a temperature higher than 150 degree C – **as claimed in claim 13**.

Zhao teaches a wafer processing apparatus comprising:

i. A heating element (107) of electrical resistances comprises thin-film (flat ribbon) electrical resistances capable of heating to 400 degree C (See Fig. 7C, Col. 7, lines 19-21; Col. 18, lines 49-55; Col. 20, lines 25-41) - **claims 10 and 13**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Collins's, Sajoto's, and Bosch's heater with Zhao's flat ribbon heating element.

The motivation to replace Collins's, Sajoto's, and Bosch's heater with Zhao's flat ribbon heating element is that Zhao's flat heating element provides a greater ratio of surface area to cross-section area, which transfers heat more effectively as taught by Zhao (Col. 20, lines 52-56).

16. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al (US Patent 6,518,195 B1), Sajoto et al, Patent Publication 2002/0015855 A1, and Bosch et al, US Patent 6506254 B1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Sopory, US 6492629 B1.

Collins et al, Sajoto et al, and Bosch et al do not teach:

i. The electrical resistances comprise thin-film electrical resistances and/or electrical resistances of the thermocoaxial type – **claim 10**.

ii. A reactor according to claim 1, characterized in that the heater liner includes a heater suitable for heating it to a temperature higher than 150 degrees C – **as**

claimed in claim 13.

Sopory teaches an electrical heating device comprising:

i. A flexible coaxial heater cable (100) that can maintain a temperature range of 500-600 degrees F(Fig. 6, Col. 7, line 18 to 38; Col. 10, lines 44-47) – **claims 10 and 13**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Collins's, Sajoto's, and Bosch's heater with Sopory's coaxial heater cable.

The motivation to replace Collins's, Sajoto's, and Bosch's heater with Sopory's coaxial heater cable is that Sopory's coaxial heater cable responds very rapidly to achieve an equilibrium state as taught by Sopory (Col. 7, lines 27-29).

17. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al, US Patent 6,518,195 B1, Sajoto et al, Patent Publication 2002/0015855 A1, and Bosch et al, US Patent 6506254 B1as applied to claims 1-3, 6, 9, 12, 15, 16 and 19-25 above, and further in view of Collins et al. (US 6063233).

Collins et al, Sajoto et al, and Bosch et al further teach:

i. The heater liner can be heated by a radiant heater (Bosch Col. 10, lines 38-40) – **in claim 11**.

Collins et al, Sajoto et al, and Bosch et al does not teach:

i. A reactor according to claim 1, characterized in that the heater liner is heated by radiant heater means such as infrared elements – **as claimed in claim 11**.

Collins teaches a plasma processing apparatus comprising:

i. Radiant heater means (see above) such as infrared elements (tungsten/halogen lamps, 72) (Fig. 4A, Col. 18, lines 17-35) – **in claim 11**.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the generic radiant heating means of Collins et al, Sajoto et al, and Bosch et al with the lamps of Collins.

The motivation for replacing the radiant heating means of Collins et al, Sajoto et al, and Bosch et al with the lamps of Collins is because this type of radiant heater has minimal thermal lag, that is, response time to temperature setting change is very short (less than one second) as taught by Collins (Col. 18, lines 17-35).

Response to Arguments

18. Applicant's arguments directed to the 112 rejection and the rejections based on Bosch et al, filed August 11, 2010, have been fully considered and are persuasive. The rejections have been withdrawn.

19. Applicant's arguments with respect to claims 1-13, 15, 16, and 19-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Friday (9:00 am -5:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-

273-8300.

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/Jeffrie R. Lund/
Primary Examiner
Art Unit 1716

JRL
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